

Protecting the Public & the Environment During Decommissioning

This is one in a series of fact sheets prepared by NASA Glenn Research Center to provide the public with information on decommissioning the closed Reactor Facility at Plum Brook

Station.

NASA views safety through many different lenses - in design, planning and implementing - and is constantly focused on protecting the public, the workers and the environment. Throughout decommissioning, NASA clearly sees safety as its number one priority.

Sources

Contained Onsite

Among the many safeguards NASA has put in place to protect the public and the environment is the use of engineering controls to prevent or minimize the release of any contamination to the air, land, surface or ground water. NASA is taking several steps to reduce radiation at its source - by decontaminating items in place before removal or by using low dust-generating techniques to dismantle and remove contaminated materials. In addition, multiple barriers, often called redundant controls, overlap to keep dust contained onsite. Constant monitoring verifies that the safeguards are effective in protecting the public and the environment.

Since 60% of the remaining radioactivity is found in the reactor internals and reactor vessel, NASA is removing them first. These activities have the greatest potential for release of contamination and therefore, will have the most barriers in place to protect the workers, the public and the environment. Reducing the radiation source from the start decreases the possibility for exposure during the remainder of decommissioning.

Multiple Barriers Overlap to Keep Dust Contained Onsite

Decontamination
NASA's ongoing
characterization efforts
will identify the types
and amounts of
radioactive isotopes
present and specify
the best methods for
cleaning a surface
based on how deeply
contamination has
penetrated. Where
possible, workers will
decontaminate by
wiping or scrubbing
the surface before
disassembly and
removal of the piece.

Local Enclosures & Local Ventilation

To keep dust contained, glovebags may be used - a pair of rubber gloves attached to heavy plastic sheeting wraps around the object to create an entirely enclosed workspace. It may be necessary to construct temporary enclosures (tents) around larger pieces for decontamination or disassembly. Portable air filtration units equipped with HEPA (High Efficiency Particulate Air) filters, which are 99.97% efficient in collecting materials to 0.3 microns, will be used to process localized air within these enclosed tents.

Source Capture During certa

During certain necessary operations (limited grinding, for example), HEPA filtered vacuums will be used to collect material at the point of origin. **Process Ventilation**

A containment enclosure will be constructed in the reactor building during segmentation. A specially designed ventilation system will be used inside the containment enclosure that filters air through a series of 16 HEPA filters. The ventilation system maintains a negative air pressure keeping air flowing into the containment area. Air is drawn from outside, constantly recirculated, and filtered of airborne contamination before being released outside.

Monitoring

NASA will verify the effectiveness of all these protective and redundant barriers by continuous air sampling inside and outside the containment enclosure. Workers and everything they carry (tools, lunchboxes) will be surveyed before leaving the site to ensure that nothing is carried outside the facility or offsite.

Effectiveness Is Verified Through Monitoring

NASA has been conducting environmental monitoring ever since the Reactor Facility was in use and during the nearly 30 years since it closed. Prior to the start of decommissioning, air, water and sediment monitoring was increased to provide a comprehensive environmental baseline. Regularly collected samples will be compared against this baseline to ensure NASA's engineering and administrative controls are effective in containing radiation onsite during decommissioning and ensuring the continued protection of the public and the environment.

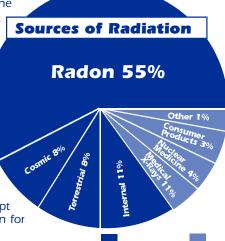
NASA Toughens Already Stringent Air & Water Limits

The Nuclear Regulatory Commission (NRC) places limits on possible releases of isotopes (of which there are several hundred types) that might be

released to air and water during decommissioning. Each limit is set to be protective of human health and the environment so that a person with continuous exposure to that level for a <u>year</u> will have a total exposure of not more than 50 millirem. This

health protective limit was established taking into account that the average American is exposed to radiation all the time and receives about 360 millirems of radiation per year, most of it from naturally occurring sources.

From the types of isotopes that are present at the Reactor Facility site, NASA chose those with the lowest, or most stringent, NRC limits as the health protective limits for decommissioning. NASA set its air and water monitors to be ten times more sensitive in detecting levels - very, very low releases. That means that NASA can take prompt action, if necessary, well before there is any concern for public health or the environment.



Natural Sources

Man-made Sources

Multi-Media Sampling

AIR

Six air monitoring stations run continuously and are designed to emit a signal if the amount of radiation present were to exceed NASA's specified health protective limit. Each air monitor is equipped with particulate filters that are collected weekly for onsite analysis of gross alpha and beta activity. Four air monitors are located at the fence - north, south, east and west - about 500 feet from the Reactor Facility. Two other air monitors sit roughly a mile "upwind" (southwest) and "downwind" (east-northeast) from the building.

WATER

Five surface water samples are taken from nearby streams and ground water samples are taken from two onsite deep wells each month. Water samples are sent to a certified laboratory and analyzed for gross alpha and beta activity.

SEDIMENT

To monitor sediment during decommissioning, NASA takes 5 samples per month at points upstream and downstream of the Reactor Facility and compares them to background levels determined by the environmental baseline as well as to NRC cleanup levels that NASA must meet for license termination. The sediment cleanup level was calculated using site-specific characteristics such as soil type, ground water flow, isotopes present and form of material left behind. A certified laboratory analyzes the samples for gross alpha, beta and gamma activity.

Commitment to Safety

NASA has been dedicated to protecting the health and safety of its neighbors for more than 45 years and will continue to do so throughout decommissioning. To date, results of air, water and sediment samples have been similar to normal background radiation levels and do not pose public health concerns.

For more information

on Decommissioning the Reactor Facility at Plum Brook Station, Contact Sally Harrington at 216-433-2037 or Email s.harrington@grc.nasa.gov. or visit us at our Website at www.grc.nasa.gov/www/pbrf or call our toll-free number at 1-800-260-3838 for regularly updated progress reports.



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